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Do aerosols impact ground observation of total cloud cover over the North China Plain?

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Ground observation of the total cloud cover (TCC) showed a significant downward trend during the past half century over the North China Plain (NCP). The objective of this paper is to examine whether aerosols have impacted the surface observations of TCC by human observers. TCC observations by the Moderate Resolution Imaging Spectroradiometer (MODIS) aboard the Aqua (TCC_{grd}) were firstly compared with ground observations (TCC_{sat}) at 201 synoptic stations over the NCP. Results showed that both data sets were in good agreement. The correlation coefficient between TCC_{grd} and TCC_{sat} ranged from 0.80 in winter to 0.90 in summer. The relationship between $TCC_{sat} - TCC_{grd}$ and visibility was then analyzed, which showed no significant correlation. Finally, long-term trends of TCC_{grd} and visibility were not correlated. These results indicated that aerosols likely did not impact the long-term trend of TCC_{grd} over the NCP.